

TOWARD A SEWER USE CONTROL PROGRAM

Since the early part of this century, municipal sewage treatment plants (STPs) have served as the main guardians of the environment against sewage pollution. During this time, the volume and complexity of wastes entering sewers has continued to expand. Today, along with Ontario's urban population, close to 12,000 industries discharge wastewater with a broad range of contaminants into municipal systems.

Toxic contaminants, present in some of these wastewaters, are not adequately treated or controlled by the protective measures now in place. Therefore, under MISA's emerging sewer use control program, the ministry is considering various options to reduce these toxic discharges.

The program, once in place, will complement the abatement regulations applied to direct dischargers under MISA. It will also answer the challenge that toxic contaminants pose for the effective treatment of sewage.

The Treatment Plants

Sewage treatment processes are designed to either break down pollutants into harmless compounds or remove and dispose of them in an environmentally safe manner.

To do this, treatment accelerates natural cleansing methods by first separating heavier solids from wastewater to form sludge. Bacteria are then introduced to break down or digest the remaining soluble organic matter; at the same time chemicals such as iron salts are added to remove phosphorus. These processes also form a sludge, leaving a wastewater that is 90% to 95% free of the solids and organic matter contained in raw wastewater.

The products of treatment are then returned to the environment: treated wastewaters are disinfected and then discharged into waterways; contaminated sludges are disposed of through incineration or by depositing in landfill sites; and the remaining sludge is used as a soil conditioner on agricultural lands.

Controlling Discharges to Sewers

Shortly after they were built, it became evident that STPs themselves had to be protected from some of the discharges entering the sewer system.

Initially, municipalities set limits on grease and oil discharges to prevent clogging. Limits were also placed on corrosive and potentially explosive materials such as acid and gasoline.

By the early 1960s, the sharp increase in Ontario's industrial activity had raised the level of toxic metals in sewage to the point where the bacteria used in treatment were occasionally killed off. Municipalities responded by establishing limits on metals discharged by industries.

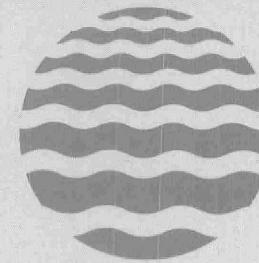
In the late 1970s, the ministries of Agriculture, Health and the Environment jointly set limits on the concentration level of eleven metals for sludge used on agricultural land. To meet these limits, municipalities again turned to users of the sewer systems and required reductions in metal discharges.

Toxic Organics: The New Challenge

In the past decade a new challenge has emerged. With advanced analytical tools and detection methods, the scientific community has identified the presence of toxic organic compounds in the environment. Some of these — persistent toxic organics — either do not degrade at all or do so very slowly and may accumulate in the environment.

Because many of these toxics can be found in STP effluents, attention has focused on toxic discharges entering the STPs. Treatment processes are effective in removing some toxics, but others still pass through. And though the concentration of toxics in the effluent is low, the volume of effluent is high, making the total loadings to the receiving waters a matter of concern.

STOPPING WATER POLLUTION AT ITS SOURCE



MISA
Municipal/Industrial Strategy for Abatement

Those persistent toxic compounds that are removed during treatment also pose a problem. Disposal of the resulting sludge may transfer toxics to other media: to air, if the sludge is incinerated; or soil, if the sludge is applied to agricultural land or disposed of in landfill sites.

Yet another problem is posed by a group of toxic organic compounds which are volatile. These compounds change from liquid to gaseous form easily, and so some escape to the atmosphere either before they reach the STP or during the treatment process.

To reduce the amount of toxics that pass through treatment, STPs could be outfitted with state-of-the-art treatment technology. But such add-ons result in diminishing returns as capital and operating costs may double, triple or more for each level of protection gained. Also, this approach would not solve the transference problem posed by sludge disposal and the volatile compounds.

These challenges point to control at source as one of the most attractive options to safeguard the environment from discharges to the sewer system.

Control at Source

Treatment of toxic-contaminated wastewater at each industrial site would allow the use of chemical-specific control and containment measures — something that STPs, as the treatment point of all wastes, cannot provide.

At the plant site, process streams can be separated to isolate wastewater contaminated with toxics. Chemical-specific recovery or treatment techniques can then be applied. As a result, a higher percentage of toxics would be either recovered, degraded into harmless compounds or removed in the form of sludge. Plants could also choose to change their proc-

esses to eliminate the creation of toxic waste.

Treatment at source also allows for better control and containment of the sludge. Incineration technology and landfill sites specifically designed for toxic contaminated sludge are available. These cannot be applied economically to large volumes of mixed sludge from STPs, but would be cost effective for sludge generated by treatment at source. At the same time, more STP sludge would be free of toxic contamination and thus suitable for spreading on agricultural land — a less expensive method than landfill disposal.

The transference problem associated with volatile toxics can also be eliminated. Volatiles would not be lost during transit if treated at source; methods could be adapted to eliminate loss during treatment.

Finally, treatment at source would be conducted by industry

Continued on page 2
TORONTO APR 21 1988

IN THIS ISSUE

- Toward a MISA Sewer Use Control Program
- MISA: Making It Work
- Environment Canada and MISA: A Cooperative Effort
- Progress Report: Sector-by-Sector
- Upcoming Events



February, 1988
Volume 1, Number 2

MISA UPDATE
is published by
The Ontario Ministry
of the Environment
135 St. Clair Avenue West
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Toronto, Ontario, Canada
M4P 1P5

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PROGRESS REPORT: Sector-by-Sector

Each industrial sector and the municipal sector pass through three main stages in the MISA program. First, each sector conducts initial sampling and analysis as part of its pre-regulation monitoring program; second, each must comply with the monitoring regulation; and third, an abatement regulation is imposed.

Joint Technical Committees (JTCs) oversee the pre-regulation monitoring program and provide advice on the content of the monitoring and abatement regulations. These committees, one for each sector, are comprised of representatives from the ministry, Environment Canada and the regulated sector.

Public review of the regulations is initially provided by the MISA Advisory Committee (MAC), a group of independent technical and environmental experts. MAC provides the Minister with advice on regulations being developed and on other MISA matters. All regulations are then released in draft form providing a sixty-day period for public review and comment.

The following summaries briefly describe the progress made to date in each of the sectors.

Petroleum Refining (7 Refineries)

In the spring of this year, the petroleum refining sector will come under MISA's first monitoring regulation. The draft regulation was released for public review in July of last year. By the end of the review period, the ministry had received about 35 submissions, the majority with comments and recommendations on the MISA priority pollutant list and analytical procedures.

Ministry officials have summarized the concerns in the submissions and are drafting responses to them. The submissions and responses will be incorporated into a ministry report and released to the public. In the meantime, the draft regulation will be revised taking the public comments and recommendations into account.

While the draft is being put into final form, the ministry and the refineries are preparing for the monitoring regulation. A major initiative for the ministry will be the training of its regional officers. These regional staff — MISA's 'front line' — will have on-going contact at the refineries, helping to implement the procedures, auditing the results and providing the first line of enforcement.

Industry, in turn, will be training their staff in the procedures required under the regulation.

Work in JTC subcommittees continues on refining the sampling, analytical and reporting procedures, and also on the development of a listing/delisting mechanism.

Organic Chemical Manufacturing (OCM) (19 Plants)

Industries in the OCM sector are involved with a wide range of processes, operations and products. As a result, the contaminants in effluent vary from plant to plant and even from pipe to pipe within the same facility.

The ministry recognized that in this situation a sector-wide, uniform

monitoring schedule would be impractical. The cost-effective and fair approach taken by the ministry was to analyze the effluent from each pipe. Then, from that and other historical data, 'pipe-specific' monitoring schedules were established. Some 90 of these have now been set for the effluents of the 19 plants.

The schedule for each effluent pipe lists the compounds to be monitored and the frequency of monitoring required. For process effluent and combined process effluent and cooling water streams, monitoring frequencies range from daily to monthly. The frequency is determined by the chemical parameters specified for monitoring. Once-through cooling water, since it does not contact process materials, will be monitored monthly.

To ensure that 'pipe-specific' monitoring is effective, the ministry will also conduct its own comprehensive analysis of the effluent at least twice during the twelve month regulatory period.

The draft monitoring regulation for the OCM sector will be released in the spring of 1988 for public review.

Pulp and Paper (27 Mills)

With pre-regulation monitoring completed, a writing team has begun work on a draft monitoring regulation. Release of the regulation for public review is expected in the summer of 1988.

A key provision in the regulation will allow for on-going revision of the monitoring list. The ministry is asking for this provision because acceptable laboratory procedures for analyzing some compounds are not available. Developing these procedures is a complex task that can take up to a year for each compound.

To avoid delay, the ministry will release the regulation and add to the monitoring list when analytical procedures are available.

The Expert Committee on Kraft Mill Toxicity expects to submit its draft report to the JTC early this year. The report will identify a range of treatment options to reduce effluent toxicity and will provide cost information.

The JTC will also complete two other reports of interest in the upcoming months. The first report, due this spring, will describe acceptable procedures for measuring resin acids and fatty acids in mill effluents.

The second report, prepared by a consulting firm, will present information on the status of all discharge pipes and the installed sampling and flow measurement equipment at each mill.

Mineral Industry (2000 Producing and Potential Facilities)

Mines locate where ore bodies are found and operate until the ore is exhausted. These fundamental facts of the mining industry pose major challenges for MISA.

With an average life span of only five to seven years, mining operations are difficult to regulate. Compounding the difficulty, many of the smaller

independent operations are in isolated locations requiring fly-in visits.

These problems notwithstanding, the Mineral Industry sector has completed pre-regulation monitoring; the final results were delivered in late November 1987.

The sector now includes all companies previously categorized by the MISA White Paper as members of the Metal Mining and Refining Sector and the Industrial Minerals Sector.

Because of the diversity of operations and effluent characteristics, the ministry anticipates the sector will be divided into 17 sub-sectors. The monitoring regulation, now being drafted, will reflect this diversity by providing monitoring schedules covering the 17 sub-sectors, including inactive and decommissioned properties.

The draft regulation will be released for public review in early summer of 1988.

Iron and Steel (7 Establishments)

Canada's largest integrated steel producers — Algoma Steel Corporation Limited, Stelco Inc. (two plants) and Dofasco Inc., — are located in Ontario. Specialty steels are produced by Atlas Steels in Welland, Lasco in Whitby and Ivaco near Hawkesbury produce mainly low carbon steels by melting scrap.

Thus Iron and Steel operations in Ontario may be grouped into three categories — integrated, specialty and those that melt scrap to produce low carbon steel. As the operations of the three groups differ widely, the JTC has agreed that separate monitoring schedules will be developed for each of these three categories.

Work began on the pre-regulation monitoring program in April 1987 and the first sampling run was completed in November. The results will be discussed at the upcoming JTC meeting.

Development of the regulation is about to begin. Public review of the draft regulation is scheduled for the fall of 1988.

Electric Power Generation (6 Thermal, 3 Nuclear, 68 Hydro-electric)

At initial JTC meetings, discussions focused on defining the sector. Ontario Hydro's nuclear and thermal plants are included in the sector. Hydro-electric plants are now being assessed for possible inclusion. Plant site visits were made in November by ministry and Environment Canada representatives.

In the fall of 1987, Ontario Hydro completed a pre-regulation monitoring program on the effluent of most of its thermal and nuclear generating stations. The ministry reviewed the program results and requested additional pre-regulation monitoring.

Intergovernmental discussions are underway to determine the monitoring responsibilities of the ministry and the Atomic Energy Control Board (AECB). The AECB is responsible for setting monitoring requirements for low-level radioactive streams at nuclear plants. As the ministry will require monitoring for toxics and conventional pollutants in the same streams, arrangements will be made to streamline all monitoring requirements.

Many issues remain outstanding,

but progress to date indicates the schedule for this sector will be met. A draft monitoring regulation for public review is expected towards the end of 1988.

Inorganic Chemical (21 Facilities)

To date, the Inorganic Chemical sector has held two JTC meetings. The discussions resulted in a schedule for future activities aimed at the release of a draft monitoring regulation this fall.

The ministry's first step was to gather more information on the industry, particularly on the plant processes and treatment systems currently in use. Ministry questionnaires were sent to the plants. These were followed by on-site visits by ministry staff in November. The purpose of the visits was to determine the appropriate points in plant process effluent streams for sampling and flow measurements.

Most of the discussion at the JTC now centres on the development of the pre-regulation monitoring program which began in January 1988.

Inorganic chemical manufacturing is another diversified sector. The range of processes and products may require site or pipe-specific monitoring schedules. This will be determined as the results from site visits and pre-regulation monitoring become available.

Metal Casting (50 Establishments)

Metal casting is a late addition to the list of industrial sectors for regulation under MISA. Originally, the industry was included with iron and steel.

Discussions in the JTC, however, indicated that including metal casting operations with those of iron and steel would entail unnecessary monitoring for both industries. Metal casting, though often associated with iron and steel making, produces wastewaters containing different contaminants.

Representatives of the metal casting industries met with the ministry for the first time in August. Since then, a pre-regulation monitoring program outline has been drafted and reviewed. This was finalized at a JTC meeting in November. Pre-regulation sampling and analysis has since begun.

Public release of the draft effluent monitoring regulation is scheduled for the fall of 1988.

Municipal Sector (400 Sewage Treatment Plants)

The joint technical committee for this sector has been divided into two: one to develop regulations for sewage treatment plants (STPs) discharging directly into waterways; and a second to develop a sewer use control program. (See "Toward A Sewer Use Control Program" for details).

The following summarizes progress in the pre-regulation program for the STPs. The ministry is conducting eight studies during the pre-regulation monitoring period. These studies are providing technical data required to develop regulations for municipal STPs.

40 STPs Survey Study

To establish a data base on toxic

contaminants in STP effluent and sludge, the ministry monitored 40 STPs during the first seven months of 1987. A cross-section of facilities was chosen: plants serving major cities with large industrial bases; plants in small municipalities with little industry; and plants offering primary, secondary and tertiary treatment processes.

The first study results, delivered in December from about half the STPs, identified the presence of dioxins, furans and PCBs in some raw sewage, STP effluent and sludge.

Though they pose no immediate threat, the ministry is continuing to study the presence and source of these contaminants.

Aquatic Toxicity in STP Effluents

In a second major area of study, the ministry has collected and reviewed historical data on toxic effects of Ontario's STP effluents. The purpose here is to determine the magnitude of the toxic effects, and then to pin-point which contaminants contribute to these effects.

To date, a literature study has established a link between toxic effects and ammonia and chlorine compounds. The literature, however, provides little information on the toxicity of other compounds. The ministry, therefore, will conduct field studies at selected STPs beginning in 1988.

Volatile Organic Contaminants

The ministry and Environment Canada are jointly studying the fate of volatile organics at four STPs. Volatiles can pose a problem when large quantities are stripped — passed into air during treatment — or absorbed into sludge and subsequently passed into air during incineration. Ideally, treatment would render volatiles harmless through degradation, changing them into simpler compounds such as carbon dioxide and water.

The study first identified contaminants that are currently removed mainly through air stripping. Phase two will establish mathematical models to determine the percentage of volatiles that are stripped, absorbed or degraded. Finally, in phase three, the ministry will recommend a plant design and operations which will minimize volatile stripping and enhance degradation.

Other Supporting Studies

The ministry, in conjunction with Environment Canada and consultants, is also conducting the following studies in preparation for regulation implementation:

- A survey of laboratories which will be able to analyze for the MISA priority pollutants.
- A study of toxic contaminant variations in raw sewage to establish optimum removal procedures.
- Tests of airborne emissions from sewage sludge incineration at STPs to determine toxic contaminant releases to atmosphere.
- A study of sewage sludge applied to land to determine the degradation in soils and the uptake by plants.

The Monitoring Regulation

A regulation writing team will be formed early in 1988. Public release of a draft monitoring regulation for the municipal sector is expected before the end of the year.



Environment Minister Jim Bradley (left) releases the draft monitoring regulation for the petroleum refining sector at a news conference last July. Also present were George Brereton (centre), Ontario Petroleum Association, and Jim Bishop, Director of the ministry's Water Resources Branch.

personnel. These individuals have the experience and training required to handle the toxic compounds created at the site.

Developing the Control Program

Under MISA, Ontario's environment will be protected by a sewer use control program equal to or surpassing any in the world. This commitment, though ambitious, will be met by a step-by-step development and implementation

process.

To initiate the process, the ministry engaged a consulting firm, M. M. Dillon Ltd., to carry out a two-phase study.

Phase I of the study reviewed control programs in sixteen jurisdictions including the United States, Britain, France, West Germany, Japan, other Canadian provinces and the Federal Government of Canada. These were screened initially to eliminate any that would not provide the standards of protection demanded under MISA.

Three screening criteria were applied: compatibility with MISA's goal of virtual elimination of toxic discharges to waterways, compatibility with MISA's method of establishing control limits, and compatibility with Ontario's jurisdictional framework.

Following this screening, four options emerged for further consideration — two American, the French program and the German program. An additional four options, combining the best features from the original list of sixteen, are also included for consideration in the study's second phase.

The Phase II study, to be released in February of this year, will evaluate in detail the eight options using cost and effectiveness criteria. The evaluation process is described in the Phase I report which was released to the public last December.

Though the control program will initially focus on industrial dischargers, the ministry recognizes that measures are required to address the discharge of household toxics to sewers. Various options are under consideration including public education programs, more accessible collection depots and enforcement measures.

Enforcing the Control Program

Protection measures are viable only to the extent that they can be enforced. In developing the sewer use control program then, the ministry is closely considering

how this is to be done. Currently, each municipality is empowered under the Municipal Act to develop and implement discharge by-laws. However, as many municipalities possess neither the expertise nor the resources to enforce stringent requirements, the by-laws vary in content and consistency of enforcement across the province.

For the stringent control program envisioned by the ministry under MISA, changes must be made. It is premature to anticipate the ministry's final position, but whatever controls are selected, they will ensure a uniform and effective program.

Public Review Opportunities

Based on both phases of the M. M. Dillon Ltd. study and other related studies, the ministry will present its preferred option in a discussion paper. The paper will identify the program development process, enforcement methods, and the roles of the dischargers and governments in the implementation of the program.

The discussion paper will also provide various options for financing the control program.

The discussion paper is scheduled for release in March of 1988. The public will be invited to review the discussion paper and both phases of the consultant's report. Once public review is complete and the ministry has considered all comments, the sewer use control program for Ontario will be adopted. The economic impact of the program will

be assessed by the ministry before the program is implemented.

An Interim Strategy for Control

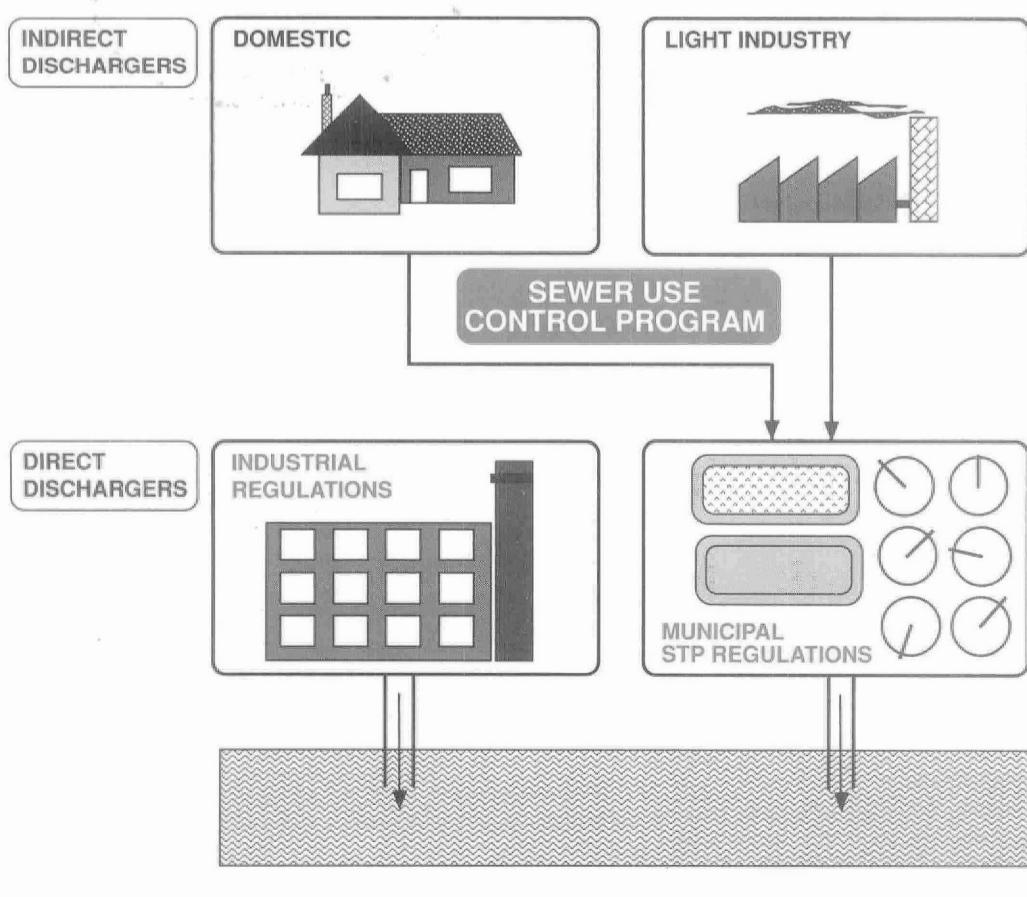
As the sewer use control program will take several years to develop and implement, the ministry is formulating an interim strategy to control toxic dumping to the sewer system. The current model sewer use by-law, which most municipalities use to develop their own by-law, is being revised and strengthened.

The ministry will include in the revised sewer use by-law general controls on toxic substances and will provide additional monitoring, inspection and enforcement tools. These measures will lead to more uniform procedures and practices across the province. The process will also help municipalities prepare for the more stringent controls that lie ahead.

The Next Step

In the next few months, both the Phase II consultant's report and the discussion paper presenting the ministry's proposal for sewer use control, will be released for public review and comment. The ministry encourages you to review these important documents and submit your comments. To receive copies of these and other reports pertaining to the sewer use control program, please contact the Public Information Centre, Ministry of the Environment at (416) 323-4321.

MISA REGULATIONS



UPCOMING MISA EVENTS

February 1988

Watch for an article by Environment Minister Jim Bradley on MISA in a new magazine titled, 'Environmental Science and Engineering' published by Davcom Inc.

February 1988

Release of 'Evaluation of Municipal Sewer Use Control Options—Phase II'. Prepared by M. M. Dillon Ltd.

March 1988

Release of sewer use control discussion paper for a 60-day public review period.

March/April 1988

Release of the draft 'Effluent Monitoring Regulation for the Organic Chemical Manufacturing Sector'

April 1988

Promulgation of 'The Effluent Monitoring Regulation for the Petroleum Refining Sector'

April 18th and 19th 1988

Annual conference of the Pollution Control Association of Ontario at the Ambassador Hotel in Kingston, Ontario.

Nars Borodzak, Assistant Director of the Water Resources Branch, will speak on MISA's monitoring and abatement regulations.

For further information contact

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10 Petch Crescent, Aurora, Ontario L4G 5N7
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MISA: MAKING IT WORK

by Jim Bishop

In Ontario we recognize the enormous value of our unique water resources. We have also witnessed the indifference and abuse that resulted in our rivers, streams and lakes becoming the receivers of industrial, agricultural and urban wastes.

Ontario's polluters for many years were subject to pollution controls that were negotiated and in the form of individual control orders issued by the Ministry of the Environment. This approach proved generally successful in reducing many types of conventional pollution.

In fact, Ontario's success in controlling pollution matched that achieved by unnegotiated permit systems used in most U.S. and European jurisdictions. Without doubt, the U.S. system is one of the most technically advanced in the world and continues to serve as an invaluable guide for Ontario. But progress in combatting pollution in the United States has been slowed by difficulties in implementing the system across all states. The European permit systems have also fallen short of the mark as witnessed by the numerous spills which have occurred in recent years. The most dramatic resulted in the destruction of most aquatic life in the Rhine River two years ago.

By the late 1970s, it was evident that neither Ontario's approach nor the permit system were adequate to control the discharge of toxic chemicals. Unlike conventional pollutants, persistent toxic chemicals do not easily break down into harmless components, and even at low concentrations they can have serious effects on all life forms.

The main problems with Ontario's approach were a too narrow range of pollutants addressed and a case by case rather than a broad systematic approach to regulation.

To correct these problems, the ministry embarked on a new control strategy in June of 1986. Today, the Municipal-Industrial Strategy for Abatement (MISA) is proceeding on a sector-by-sector basis to first identify what toxic pollutants are being discharged, and then to set abatement limits on all dischargers in Ontario. These limits will systematically reduce all known toxic substances discharged to Ontario's waterways.

From the earliest days of program development, the ministry recognized that MISA would pose no small challenge. It would have to be achieved in a relatively short time by the concerted efforts of both those regulated and those responsible for implementing and enforcing the regulations. And, furthermore, through all phases of design and implementation, the program had to be technically sound.

Technically sound. The term has a simple enough ring to it. It is even an innocuous term, easily overlooked or disregarded in a casual reading of a plan or rationale. And yet, it is this very aspect — the technical soundness of the program — that has become the hallmark of MISA. It has to be for the sake of the workability of the program.

Technical soundness means reliability, repeatability and accuracy. For example, the program must provide analytical procedures that are repeatable; it must supply accurate technical methods for setting the definition of Best Available Technology Economically Achievable (BATEA) for each sector; and it must generate reliable data for developing a technically sound mechanism for adding or deleting substances from the list of those to be monitored. Technical soundness must pervade every aspect of the MISA program if it is to maintain its credibility with those to be regulated and the public.

In addition to its reliance on technical soundness, another strength of MISA is that it is being developed by both the regulators and those regulated. Industry and government representatives share facts, perspectives, principles and suggestions. This consensual approach helps create regulations that are tough but fair, and that will protect the environment but not bankrupt those regulated.

Inevitably, with a program as comprehensive and progressive as MISA, there will be doubts about whether it can be successfully managed. Some are concerned about how much time it will take to properly develop and implement MISA, particularly to establish its technical soundness. Others question its rapid rate of growth and the many scientific and legal areas the program must move into, and the myriad side issues that must be unravelled,

solved and rewoven back into the fabric of the program (storm water management, control of industrial sewer use, and water quality impact studies, to name a few). But these are the challenges that must be—and will be—addressed if we are to clean up Ontario's waterways.

Today's environmental problems, though often simplified by rhetoric, do not fit into neat disciplinary compartments. They are not simply engineering problems, or chemistry problems, or biology problems, or modelling problems. Instead these problems require technical information from several disciplines to be synthesized into satisfactory solutions. They also need the scrutiny of a range of viewpoints to properly place each part of the problem into perspective. The final challenge is to address environmental problems rationally, consensually and on the basis of technical soundness.

No one embarking on such a task could imagine that it would be easy. What MISA has already accomplished in two years is undoubtedly cause for optimism. But more importantly, if we continue to adhere to MISA's key principles of technical soundness and consensual development, I have every expectation that progress will continue steadily towards MISA's goal of virtually eliminating toxic discharges to Ontario's waterways.

Environment Canada and MISA: a Co-operative Effort

In 1985 Environment Canada accepted an invitation from the Ontario Ministry of the Environment to co-operate in the development of the MISA program. By adding its technical and scientific expertise to the program, Environment Canada is building on previous federal-provincial co-operative efforts to achieve the goal of virtually eliminating all toxic discharges to the Great Lakes.

This goal, expressed in the Canada-U.S. Great Lakes Water Quality Agreement, has been jointly addressed by Canada and

Ontario since 1971. At that time, the Canada-Ontario Agreement Respecting Great Lakes Water Quality was signed to assist Canada in meeting its international obligations with the United States.

The federal-provincial agreement has led to a number of co-operative programs. One example is the current development of remedial action plans (RAPS). The RAPS will address the environmental problems of 17 of the most heavily polluted areas in the Canadian portion of the Great Lakes Basin.

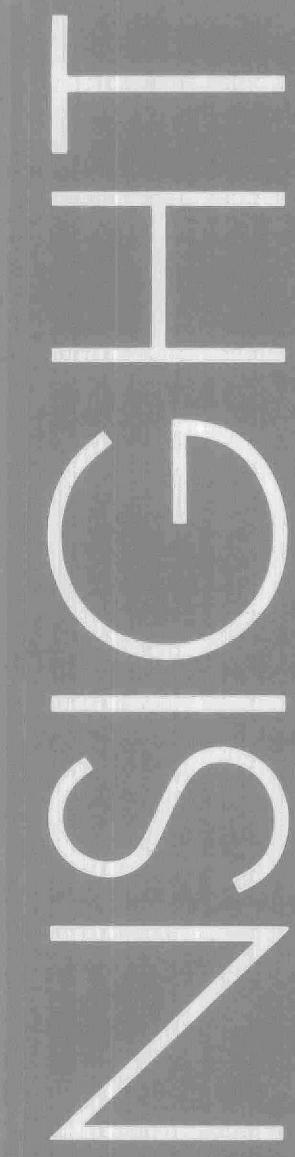
Environment Canada views MISA as a means to accelerate the virtual elimination of toxic discharges to Ontario's international waterways. In addition, MISA strongly promotes key principles of water quality protection: the use of best available technology economically achievable and pollution control at source.

These principles will make an important contribution to the new, comprehensive Canadian Environmental Protection Act (CEPA). The successful implementation of CEPA will require negotiations with the provinces. Such negotiations will depend to a large extent upon compatible and effective provincial controls. Environment Canada expects Ontario's progress in the development of the MISA program to make a major contribution to this process.

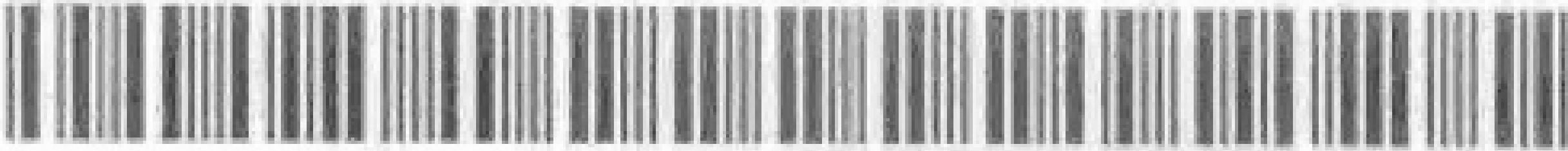
For Ontario, federal involvement adds an important national and international perspective to MISA. Environment Canada is in a position to encourage other provinces and the United States to undertake similar stringent toxics programs and has agreed to support the adoption of MISA's principles in other jurisdictions.

Currently, Environment Canada and the ministry are working together on a range of joint projects and studies tackling water quality assessments, effluent toxicity and the evaluation of specific treatment technologies for the municipal and industry sectors. Both agencies and industry are represented at the joint technical committees for each sector and work closely on several analytical and scientific sub-committees.

Environment Canada and the Ministry of the Environment see significant benefits for their respective jurisdictions as a result of their joint efforts in MISA. In the words of Ontario's Minister of the Environment, Jim Bradley, "Environment Canada's expertise is both welcome and appreciated. The co-operative approach serves as an example of the kind of team effort that produces the results both governments are seeking for the environment."



Jim Bishop was appointed Director of the Water Resources Branch in 1984. He is responsible for the MISA office, which comprises the industrial, municipal and data management sections, as well as the Water Quality Office. (Aquatic Biology, Great Lakes, Limnology and River Systems Sections) and the Drinking Water Section.



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